REMARKS

The present Amendment amends claims 21, 24, 27, 37, 43 and 51 and leaves claims 23, 26, 29-32, 34-36, 38, 39, 41, 42, 44-50 and 52-55 unchanged. Therefore, the present application has pending claims 21, 23, 24, 26, 27, 29-32, 34-39 and 41-55.

The Examiner's cooperation is respectfully requested to contact Applicants' Attorney by telephone to schedule an interview so as to discuss the outstanding issues of the present application prior to examination. Such an interview is particularly necessary and urgently requested being that the claims recite features and have been amended to clarify such features and such features are not taught or suggested by any of the references of record whether taken individually or in combination with each other.

Claims 21, 23, 24, 26, 27, 29-32, 37-40, 46, 47, 52 and 53 stand rejected under 35 USC §103(a) as being unpatentable over Hashemi (U.S. Patent No. 5,337,414) in view of Nakamura (U.S. Patent No. 5,388,013); claims 34, 35, 41, 42, 48, 49, 54 and 55 stand rejected under 35 USC §103(a) as being unpatentable over Hashemi in view of Nakamura and further in view of Cheney (U.S. Patent No. 5,285,456); and claims 36 and 50 stand rejected under 35 USC §103(a) as being unpatentable over Hashemi in view of Nakamura and further in view of Dixon (U.S. Patent No. 4,637,024). These rejections are traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in the claims are not taught or suggested by Hashemi, Nakamura, Cheney or Dixon whether taken individually or in combination with each other as suggested by

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the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to each of the independent claims to more clearly recite that the present invention as now more clearly recited in the claims provides that the host adaptor, or the at least one adaptor, includes a format converter for converting data of a count-key-data (CKD) format, in a case where the host adaptor or the at least one adaptor receives the data of the CKD format from the host device, into data of a fixed block architecture (FBA) format suitable for storage in the storage devices before being stored in the cache and sending the converted data of the FBA format to the cache through buses.

Thus, the present invention as now more clearly recited in the claims provides unique advantages over that of conventional systems being that as recited in the claims the conversion is performed before data is stored in the cache memory. Therefore, less storage is necessary when the present invention is implemented compared to that of conventional systems in which the CKD data before conversion is stored along with the FBA data after conversion. Accordingly, in conventional systems twice the amount of storage is necessary to perform this function contrary to that of the present invention as now more clearly recited in the claims.

In the Office Action, the Examiner alleges that Hashemi teaches a storage system including host adaptor 8C1 and 8C2, a plurality of storage devices 70 A-D, a plurality of disk adaptors 8D1-8D2, a cache memory 24C1, 24C2, 24D1 and 24D2 and two buses 6a and 6b. However, the Examiner recognizes various deficiencies of Hashemi relative to the features of the present invention as recited in the claims. Particularly, the Examiner notes that Hashemi does not teach or suggest that the

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host adaptors includes a format converter to convert data from the CKD format to the FBA format and storing the data of the FBA format in the cache memory as in the present invention as recited in the claims.

The Examiner attempts to supply these deficiencies by combining Hashemi with Nakamura. Nakamura teaches a technique in which a magnetic disk controller 5 includes a channel path server 51 and a cache memory 6, whereby data of CKD format from a host computer is stored in the cache memory 6 as it is and then the data of the CKD format read from the cache memory 6 is converted into data of the FBA format. Thereafter, as taught in Nakamura, the data of the FBA format converted from the data of the CKD format is stored into the cache memory 6 in a location alongside of the data of the CKD format. Further, Nakamura teaches that a data path server 55 reads and writes data between the cache memory 6 and an FBA disk 9 in the form of the FBA format as it is. The Examiner's attention is directed to col. 10, line 68 through col. 11, line 4, col. 11, lines 12-20 and col. 14, lines 15-20 and in Figs. 1 and 2 of Nakamura.

The above described procedure as taught by Nakamura is exactly the procedure the present invention seeks to avoid. This procedure as implemented in Nakamura requires twice the amount of storage relative to the present invention since sufficient storage must be provided to accommodate both the data of the CKD format before conversion and the data of the FBA format after conversion. The present invention as recited in the claims simply requires sufficient storage to accommodate data of the FBA format since the conversions is performed before data is storage in the cache memory. Accordingly, Nakamura suffers from the same

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deficiencies as conventional systems as described above relative to the present invention as recited in the claims.

The present invention overcomes the disadvantages of the conventional systems and Nakamura by providing that the CKD format data is converted prior to being stored in the cache memory. According to the present invention the cache memory need not have enough storage area to accommodate both the CKD format data prior to conversion and the FBA format data after conversion as in the conventional systems and Nakamura.

Thus, both Hashemi and Nakamura fail to teach or suggest that the host adaptors includes a format converter for converting data of a CKD format, in a case where the host adaptors receives the data of the CKD format from the host device, into data of a FBA format suitable for storage in the storage device before being stored in the cache memory, and sending the converted data of the FBA format to the cache memory through the two buses as recited in the claims.

Therefore, both Hashemi and Nakamura are deficient of the above described features of the present invention as now more clearly recited in the claims and as such when combined fail to teach or suggest the features of the present invention as recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 21, 23, 24, 26, 27, 29-32, 37-40, 46, 47, 52 and 53 as being unpatentable over Hashemi in view of Nakamura is respectfully requested.

The above described deficiencies of both Hashemi and Nakamura are not supplied by Dixon. Dixon is merely relied upon for an alleged teaching of the use of ECC and CRC codes. Thus, Dixon does not teach or suggest any of the above described features as now more clearly recited in the claims and as shown above

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not to be taught or suggested by Hashemi or Nakamura, wherein the host adaptor converts CKD format data from a host device into FBA format data prior to being stored in the cache memory and sends the converted data of the FBA format to the cache memory through the buses. Such features are clearly not taught or suggested by Dixon.

Thus, Dixon fails to teach or suggest that each host adaptor includes a format converter for converting data of the CKD format, in a case where the host adaptor receives the data of the CKD format, from a host device, into data of a FBA format suitable for storage in the storage devices before being stored in the cache memory, and sending the converted data of the FBA format to the caches through the two buses as recited in the claims.

Therefore, Hashemi, Nakamura and Dixon suffer from the same deficiencies relative to the features of the present invention as recited in the claims and as such when combined fails to teach or suggest the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 36 and 50 as being unpatentable over Hashemi in view of Nakamura and further in view of Dixon is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 21, 23, 24, 26, 27, 29-32, 34-39 and 41-55.

In view of the foregoing amendments and remarks, applicants submit that claims 21, 23, 24, 26, 27, 29-32, 34-39 and 41-55 are in condition for allowance.

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Accordingly, early allowance of claims 21, 23, 24, 26, 27, 29-32, 34-39 and 41-55 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (500.33021CX5).

Respectfully submitted,

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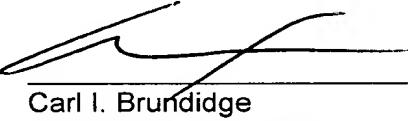
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